

Chlorine Test Kits

Are you aware of what you are measuring when you use a chlorine test kit to measure the concentration of sodium hypochlorite (chlorine bleach) solutions?

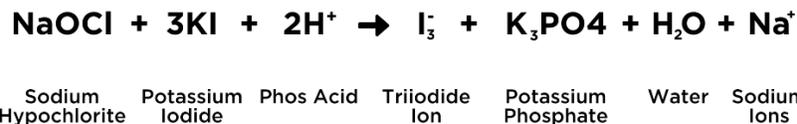
When testing the concentration of sodium hypochlorite, you are performing what is known as an *Iodometric Titration*. You are actually titrating iodine species and not hypochlorite!

When testing solutions containing sodium hypochlorite (NaOCl), the general procedure is as follows:

1. Obtain a 12 ml sample of solution to be tested.
2. Add 10 drops of #5 20% KI (Potassium Iodide) solution and mix.
3. Add 10 drops of #12 42.5% Phosphoric Acid solution and mix. If chlorine is present, the solution will turn a yellow-amber or amber-brown color.
4. Add 2-3 drops of #8 Starch Solution. The color will change to blue-black.
5. While swirling the vial, titrate with #2 0.1N Sodium Thiosulfate, counting the drops until the solution turns from blue-black to clear.
6. Calculation: #of drops x 10 = ppm free chlorine

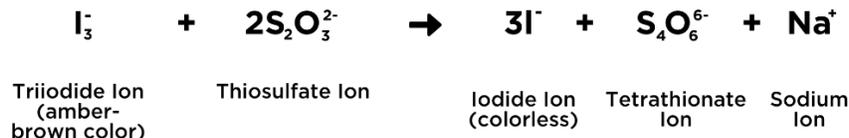


When the Potassium Iodide (KI) is added to the vial and is then acidified with the Phosphoric Acid, all of the Hypochlorite ion (OCl-) is converted to Tri-iodide (I₃⁻) according to the equation:



Every hypochlorite ion is *converted* to an equal number of Triiodide Ions. Triiodide ions exhibit an amber-brown color in solution. This is why the solution turns to an amber-brown color if chlorine is present.

What you are actually measuring/titrating is the Triiodide ions, and not the Hypochlorite (OCl-) ions, according to the equation:



Important Points to Note:

1. Similar reactions occur if your sample contains a different oxidizer than hypochlorite—for example, Hydrogen Peroxide! Therefore, this test kit titrates generic oxidizers...not just chlorine bleach! When the test vial turns to an amber-brown color, it just indicates that your sample contains an oxidizer...it MAY NOT be hypochlorite.
2. If you have a test solution that may contain both sodium hypochlorite and hydrogen peroxide, both oxidizers will react with, and neutralize, one another. Only the one present in *higher concentrations* will partially remain and be detected by the test kit!

Reach out to the **RITE team** for more information on proper flow for membrane systems.